

sisis

OPERATING INSTRUCTIONS

SISIS EQUIPMENT (Macclesfield) LIMITED, Hurdsfield, Macclesfield, Cheshire Sk10 2LZ, England

Tel (01625) 503030 Fax (01625) 427426 Email info@sisis.com Website www.sisis.com

SISIS INC, PO Box 537, Sandy Springs, SC29677, USA

Tel (864) 843 5972 Mobile (864) 934 1022 Fax (864) 843 5974 Email idc@sisis.com Website www.sisis.com

AUTO-ROTORAKE Mk. 4

MACHINE REFERENCE

ARR/4 Briggs & Stratton Engine

SERIAL NUMBER

.....

CN CODE

8432 29 10

£12.00

+ VAT

SPARES HOTLINE 01625 503020

Website www.sisis.com

EC DECLARATION OF CONFORMITY

The undersigned:-
as authorised by:- (Manufacturer) SIS EQUIPMENT (Macclesfield) LIMITED

Declares that the:- Scarifier

Name/Model:- AutoRotorake

Type/Serial No:- ARR/4

Engine Power:- Briggs & Stratton

Mass in kg:- 102 kilos

Cutting width:- 550mm

Net installed power- 5.5hp

Manufactured by SIS EQUIPMENT (Macclesfield) LIMITED
conforms to the Directive:- 2000/14/EC

of the European Parliament and of the council on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors.

The technical documentation is SIS EQUIPMENT (Macclesfield) LIMITED
kept by:- Hurdsfield, Macclesfield, Cheshire Sk10 2LZ, England

The conformity assessment procedure followed was in according with annex (C) of the Directive

Notified Body:- N/A

Measured Sound Power Level:- 79dB

Guaranteed Sound Power Level:- 100dB

Place of Declaration:- SIS EQUIPMENT (Macclesfield) LIMITED

Date:- 17th November 2005

Signed by:-



Position in Company:- Development Manager

Name and address of manufacturer of Authorised representative:-
SIS EQUIPMENT (Macclesfield) LIMITED
Hurdsfield, Macclesfield, Cheshire Sk10 2LZ, England

Please read these Operating Instructions carefully BEFORE commencing work.

We want you to obtain the best performance from this machine. If you have any difficulty in carrying out the following instructions please contact SISIS direct or your local SISIS Territory Manager or SISIS Dealer.

CONTROLS

Ground wheel clutch control lever. 'Dead Mans handle' type

Reel clutch engage-disengage lever

Engine cut out switch

Micro-adjuster to regulate depth of cut

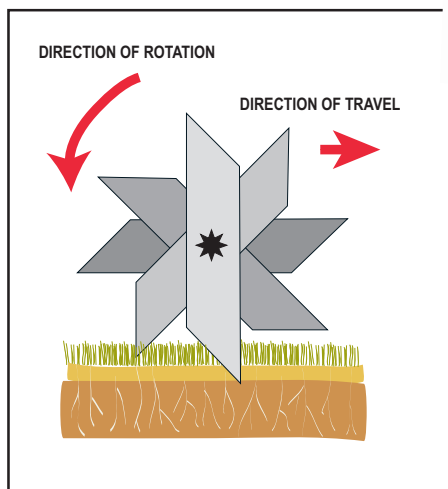
OPERATING PRINCIPLE

Power from the engine is transmitted through a vee belt clutch mechanism. One powers the tine reel through a cross shaft with a final chain drive. Forward travel power is supplied through a cross shaft, spur gearing and a differential gear box, to the ground wheels. The depth of cut is simple to alter with the micro-adjuster on the handle connecting through to the front roller frame.

SISIS CONTRA-ROTORAKE PRINCIPLE

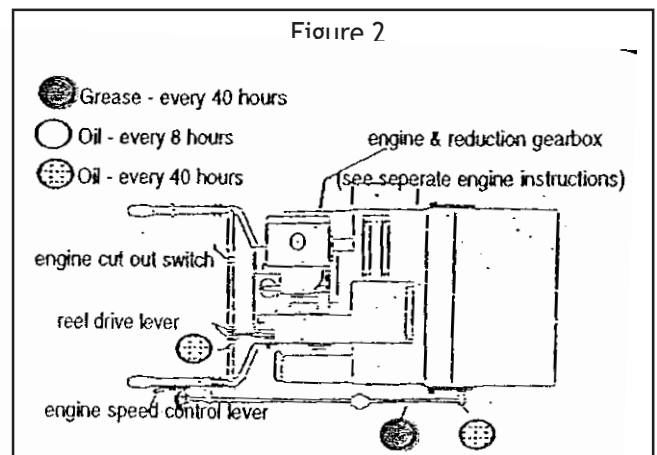
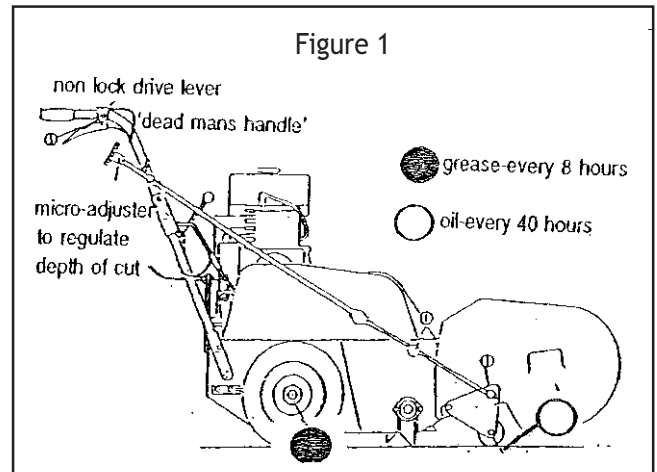
The Rotorake principle incorporates a reel of blade rotating at high speed in the opposite direction to that of the conventional cylinder mower.

The blades therefore cut upwards, continuously taking fibre away from the surface rather than pushing it into the surface. This also ensures that the machine is held to the ground and a regular working depth maintained.



OPERATING YOUR AUTO-ROTORAKE

SAFETY WARNING when working without the grass box, lower the deflector to protect the operator and engine air intake. Read the instructions carefully and also the separate instruction details on the engine. Ensure that the engine and speed reduction box are filled to the correct level with the recommended grade of oil. Always check the oil with the engine level. Apply grease or oil to all parts where marked on drawings. See figures 1 and 2.



REELS

THATCH REMOVAL REEL reference STR/TRR (FS087.27)

For the removal of an existing bulk up of excess fibre. Comprises 24 hardened and tempered steel blades mounted on to the shaft 19mm (3/4in) apart. Soft rubber washers are fitted between the blades to permit flexing and reduce danger of breakage.



THATCH CONTROL REEL

reference ST/TCR FS087/09

Designed to keep fine turf free of thatch, this reel is most useful for newly constructed greens and tees. Particularly effective for removing coarse, broad leaved grasses. The triangular hardened and tempered steel blades have very sharp cutting edges. Blade points are offset to give a closer pitch.



COMBINED REEL

reference ARR/TBR FS290

Thatch removal blades are pitched 20mm (3/4in) apart and interspersed with brushes. This reel removes thatch efficiently with the added benefit of a brushed finish and improved collection of debris. Used prior to mowing, it raises the grasses for a better cut.



ROLASPIKE REEL

reference ARR/RS FS666

Light surface spiker with 96 tines penetrating to a depth of 10mm-15mm (3/8in-5/8in). Used to assist in the absorption of water, air and nutrients.



SELECTING CUTTING DEPTH

- a) THATCH REMOVAL REEL reference ST/TRR
THATCH CONTROL REEL reference ST/TCR

The blades or wires must be CLEAR of the ground before adjustment commences. The depth of cut is adjusted by varying the height of the front rollers, using the micro adjuster.

IMPORTANT

disengage the reel clutch before starting the engine.

Start the engine and allow to warm up. Engage the ground wheel and reel drives and lower the reel using the micro adjuster until the required amount of thatch is being removed. Always disengage the reel drive when the machine is stationary on the green.

BRUSH REEL

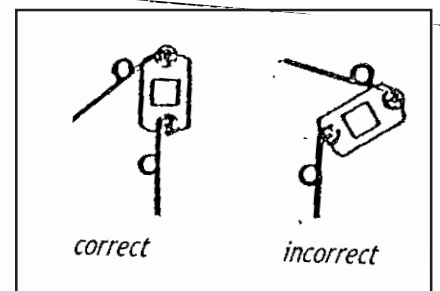
reference ARR/BR FS818

Used in conjunction with the grass box, ensures that all fine residue in the grass sward is removed, as well as light surface debris. Horizontal grasses are lifted into an ideal position for mowing and greens can show an increase in speed. Brush height is fully adjustable.



- b) SURFACE SCARIFYING REEL reference ST/WR

If a hard flat surface is available, e.g. a path, alongside the green, then the reel can be turned until the tip of the tine just touches the surface. The point to emphasize in this method, however, is that the wires must be vertical and the stay bar on which the wires are mounted should be in the 6 o'clock position.



VERTICUTTING REEL

reference ARR/RRT FS292

Reel comprising close pitched, straight, triangular blades for light scarification during the growing season. Regular use removes thatch as it accumulates.



- c) BRUSH REEL reference ARR/BR

The brush reel, used in conjunction with the grass box, ensures that all fine residue in the grass sward is removed, as well as light surface debris. The horizontal

grasses are lifted into an ideal position for mowing and greens treated with the brush prior to cutting can show an increase in speed. Brush height is fully adjustable to provide the desired effect, from severe remedial treatment to the lightest contact for cosmetic striping of fine turf.

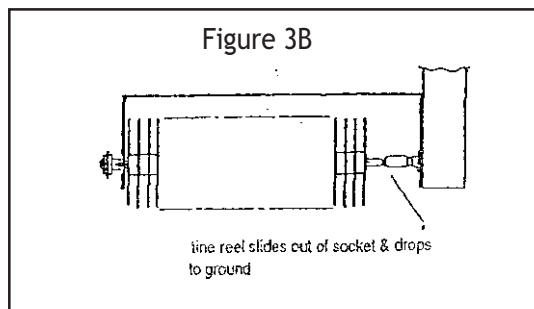
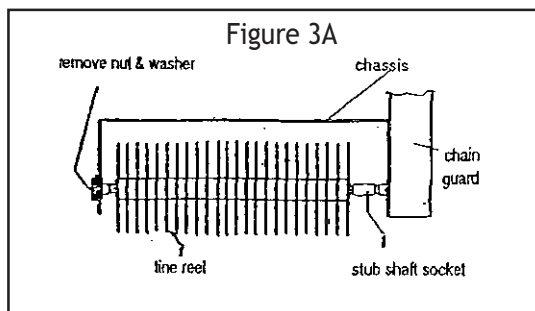
MAINTENANCE AND LUBRICATION

Always switch off the engine before attempting any machine maintenance work.

CHANGING REELS see figures 3A and 3B

To Remove the Tine Reel

Raise the reel completely clear of the ground using the micro adjuster. Remove the nuts and washers, securing the bearing to the sideplate. Slide the tine reel out of the socket on the stub shaft (item 32). Lower it to the ground and remove it from the machine. Reverse the procedure to fit alternative reel.



REPLACING BLADES OR WIRES

Carry out the procedure for removing the reels. For convenience place the reel on a bench when working on it.

- a) **THATCH REMOVAL REEL** reference ST/TRR
THATCH CONTROL REEL reference ST/TCR

Remove the washer and split pin at the end of the reel (opposite end to which the bearing is fitted) and strip off the knives and rubber spacers. Replace the knives

making sure that you follow the original spiral pattern, which is sown on the drawing. Replace the washer and split pin. You will find it necessary to compress the flexible assembly in order to replace the split pin. Replace the reel, reversing the procedure for removal.

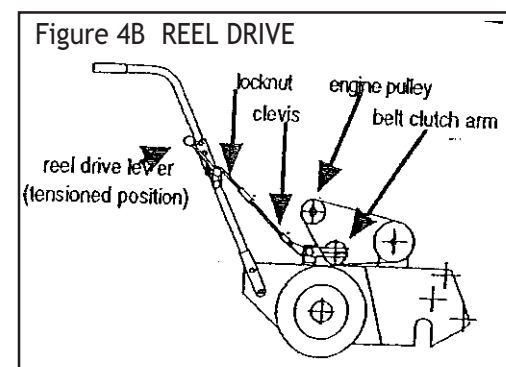
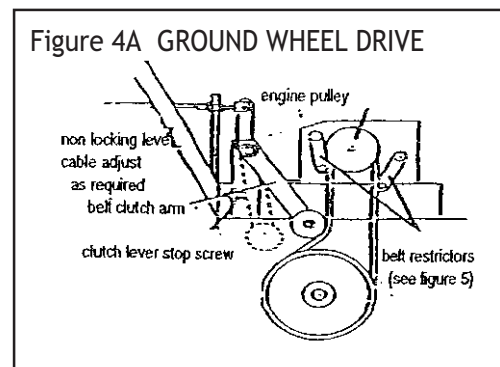
It is not advisable to fit a few new knives. Always replace with a full set of new knives. On the thatch control reel ONLY, it is possible to maintain even wear on the blades by removing the reel and replacing the blades in the reverse position on the shaft.

- b) **SURFACE SCARIFYING REEL** reference ST/WR

Remove the washer and split pin at the end of the reel (opposite end to which bearing is fitted) and slide off the wire tine units. It is not possible to replace a single wire tine, a complete unit of 4 tines is required.

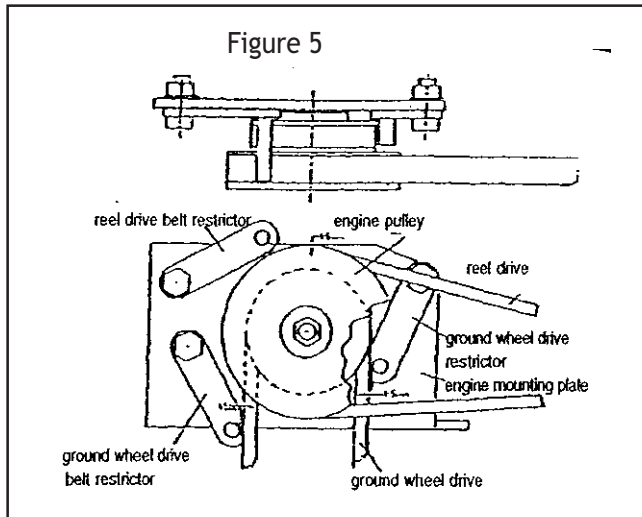
ADJUSTING BELT TENSION figures 4A and 4B

Both the ground wheel drive and the reel drive vee belt tension can be adjusted by removing the clevis from the tension arm, slackening the lock-nut and turning the control rod so that it is shortened, to give more or less tension. Refit the clevis pin and secure the clevis with the locknut. Adjust clutch lever stop screws to suit. The engine may be moved on its slots to give greater tensions if required.



FITTING NEW VEE BELTS Figure 5

Take off the belt guard by removing the nuts, spring washer and setscrews. Slacken the belt restrictors on the engine mounting plate and swing them away from the belts. If replacing both vee belts, the smaller belt fits nearest the engine. Adjust belt tension as described in section 'Adjusting Belt Tension'. Put both drive and reel drives on. Reposition the restrictor plate to give 1/16in (1.5mm) clearance between belts and pegs, as



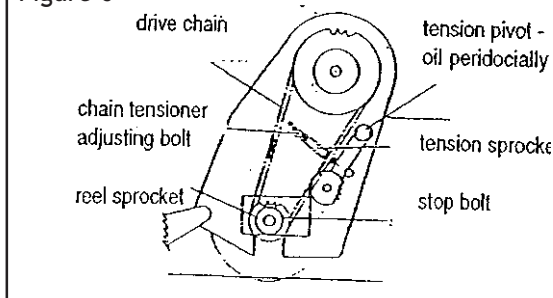
shown.

With the engine stop switch in the OFF position and the reel drive lever in the OFF position ensure that the engine pulley is free to turn without gripping the belts. To do this, pull the engine recoil starter. If the pulley drives either or both belts, readjust as necessary.

IMPORTANT

The belt restrictor should not be in contact with the vee belt when in the engaged/driving position, as this can result in a premature breakdown of the vee belt structure. If, by adjusting the belts as described above, there is belt slip whilst being driven, further adjustment to the clutch arm is necessary (see figure 4A). The same also applies to the reel drive (see figure 4B).

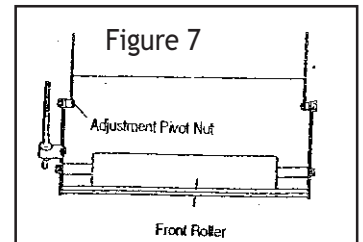
CHAIN DRIVE ADJUSTMENT Figure 6



Firstly, take off the chain guard by removing the two securing nuts and washers. Remove the nut and bolt securing the tension spring to the chassis and refit in next hole up. Check chain for lubrication and refit chain guard.

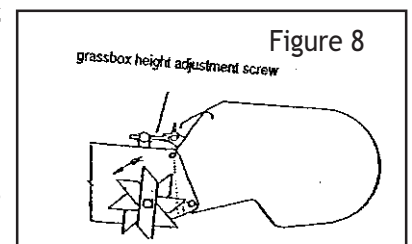
FRONT ROLLER ADJUSTMENT Figure 7

An adjustment pivot nut is fitted at one side of the front roller frame assembly. This has been factory set, during assembly and should not require further adjustment. However, if the machine has been dismantled for maintenance purposes or mishandled at any time, the front roller can be adjusted by placing the machine on a level surface, with the tine reel removed and rotating the pivot nut. The front roller is aligned correctly with the rear ground wheels when all three are resting on the surface.



GRASS BOX ADJUSTMENT WHERE APPLICABLE Figure 8

As the front roller is adjusted to compensate for wear, it will also become necessary to adjust the grassbox height to prevent the bottom of the box touching the ground. This is achieved by slackening the locknuts on the height adjustment screw and repositioning the box as shown on figure 8. Retighten the locknuts.



SAND DEFLECTOR KIT

Offer rubber flap up to deflector. Centralise rubber so that it is square. Mark holes through rubber. Drill through with 8.5 or 9mm drill. Fit rubber with metal brace on the outside. Tighten bolts with 13mm spanners.

SAFETY HINTS

ALWAYS

read the Operating Instructions carefully and

understand the controls before commencing work.

be extra careful when using petrol or diesel fuel.
DANGER no smoking or naked lights.

use safety guards and make sure they are correctly
in position. they are supplied for your protection

visually check machines, before starting work, for
damage or wear to working parts such as blades or
tines.

respect powered machines. always keep hands and
feet clear of moving parts and remember that tine
cylinders or drums can continue to rotate even after
the power unit is switched off.

switch off the power before making adjustments
or repairs and never lift or carry a machine whilst
any parts are moving.

SISIS CONTACT TELEPHONE NUMBERS

Sales	01625 503030
Sales Hotline	01625 503020
General	01625 427427
Purchasing	01625 262450
Accounts	01625 263189
Fax all departments	01625 427426
Email all departments	info@sisis.com
Website	www.sisis.com

NEVER

allow any unauthorised person to handle machines
in any way at any time.

EYE PROTECTION

in dry, dusty or windy conditions it may be necessary
to wear eye protection to protect your eyes from
flying debris.

FIRE HAZARD

ALWAYS

**CLEAN THE MACHINE. REMOVE ALL DEBRIS FROM
AROUND THE ENGINE. BLOCKED ENGINE COOLING
FINS CAN CAUSE THE ENGINE TO OVERHEAT.**



PARTS LIST & DRAWINGS

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AUTO-ROTORAKE Mk. 4

MACHINE REFERENCE

ARR/4 Briggs & Stratton Engine

SERIAL NUMBER

.....

CN CODE

8432 29 10

SPARES HOTLINE 01625 503020

Website www.sisis.com

<i>item</i>	<i>part</i>	<i>description</i>	<i>qty</i>	<i>item</i>	<i>part</i>	<i>description</i>	<i>qty</i>
1	1013	parallel key	1	58	6619	over centre rod	1
2	1015	black plastic knob	1	59	6620	drive lever	1
3	1034	split pin	2	61	30963	drive lever pivot shaft	1
4	1040	split pin	7	62	6623	adjustment rod support	1
5	1062	flat spring washer	6	63	7993	adjustment rod	1
6	1063	flat spring washer	10	64	7985	lower handle assembly	1
7	1072	LP plain washer	6	65	6626	adjusting handle	1
9	1116	bolt	2	66	6627	adjusting handle	1
10	1122	setscrew	2	67	7986	chain guard	1
11	1121	bolt	2	68	7987	belt guard	1
12	1220	nyloc nut	1	70	1126	bolt	1
13	1223	nyloc nut	3	71	6632	grass box	1
14	20214	half nut	4	72	8731	insulated recepticle	1
15	1871	pop rivet	4	73	36842	special pulley	1
16	32336	standard nameplate	1	74	32150	roller frame assembly	1
18	1572	parallel key	1	75	6636	roller shaft	1
19	1588	bearing	2	77	6638	grass box ferrule	2
20	22039	vee belt	1	78	8362	insulated blade connector	1
21	1628	woodruff key	1	80	7991	belt pin	2
22	1878	yoke end and clevis pin	1	81	6642	wheel scraper	2
23	1879	handwheel	1	82	6663	differential assembly	1
25	1989	grub screw	1	83	6664	wheel hub	2
26	2390	square bore washer	2	84	8042	tension spring	1
27	2991	bearing	5	85	8048	bearing	2
28	31197	roller	1	86	8056	external circlip	2
29	3013	transfer	1	87	1123	bolt	1
30	4889	tine blade	24	89	8158	oilite bearing	1
31	4957	ferrule	1	90	8165	parallel key	2
32	5113	stub shaft	1	91	8173	ball bearing	2
33	1367	tension spring	1	92	8175	external circlip	3
34	5134	stub shaft collar	1	93	8177	internal circlip	1
35	5117	tine reel shaft	1	94	8216	roller chain	1
36	1/5123	chain guard stud	2	95	22033	engine	1
37	5135	offset ferrule	1	96	8256	hand grip	2
38	6182	pivot shaft	1	97	8270	LP plain washer	2
39	6189	pinion	1	98	8275	oilite bearing	2
40	7976	main chassis assembly	1	99	8989	vee belt	1
41	7977	spur gear	1	100	1/1039	setscrew	18
42	6603	spur gear	1	101	1/1062	spring washer	36
43	6604	pulley	1	102	1/1063	spring washer	18
44	2924	pulley	1	103	1/1072	plain washer LP	16
45	6606	sprocket	1	104	1/1073	plain washer LP	5
46	6607	sprocket	1	105	1/1105	setscrew	2
47	6608	layshaft bearing bracket	1	106	1/1107	setscrew	1
48	31033	layshaft	1	107	1/1118	setscrew	13
49	7979	jockey tensioner arm	1	108	1/1120	bolt	5
51	7980	belt tensioner arm	1	109	2355	tine rubber spacer	23
52	7981	belt tensioner arm	1	110	1/1220	nyloc nut	47
53	7982	gear cover	1	111	1/1223	nyloc nut	23
54	6615	gear shaft	1	112	1/1221	half nut	3
55	6616	gear spacer	1				
56	30604	belt adjustment rod	1				

PARTS LIST & DRAWINGS : SISIS AUTO-ROTORAKE Mk. 4 model ARR/4 WI/ARR4/04/05

item	part	description	qty
113	1/1436	setscrew	8
114	1/1647	setscrew	4
115	6643	layshaft cover	1
116	30964	control transfer	1
117	1/1110	setscrew	1
118	21061	wheel and tyre	2
119	8153	grub screw	5
120	8354	idler	1
122	6731	control cable	1
123	1442	standard non lock lever	1
124	1356	cable clip	4
125	1394	on/off switch	1
126	1392	length of single core cable	1
127	1951	setscrew	8
129	1130	bolt	1
133	8091	grub screw	1
134	32151	depth adjustment screw	1
135	1/1076	LP washer	3
137	7819	pivot	1
139	1/1227	half nut	6
140	8734	niversal joint	1
141	7908	protective cover	2
142	7824	flap adjuster	1
143	8175	circlip	2
144	8436	shaft locking pin	1
145	7816	fla pivot	1
146	7999	grass box support flap	1
147	8271	RH throttle lever	1
148	30276	throttle cable	1
149	30244	long belt pin	1
150	32152	pivot bolt	1
151	1/1231	nyloc nut	1
152	30594	spacer	1
153	1/1094	setscrew	1
154	1572	paralell key	1
156	1073	LP washer	2
157	1539	mudguard washer	1
158	7995	cover	1
159	1217	nut	2
161	20016	self stripping connector	1
162	1217	nyloc nut	1
163	1854	sel lok pin	1
164	8295	idler pulley	1
165	1083	LP washer	1
166	1084	HP washer	1
167	1812	P clip	2
168	1/1116	bolt	1
169	1792	tension spring	1

item	part	description	qty
170	8189	circlip	1
171	36864	stud block	2
172	1/1081	LP washer	2
173	324297	spacer	1
174	36341	spacer plate	2
175	20714	plastic wing screw	1
THATCH CONTROL REEL			
item	part	description	qty
	1034	split pin	2
	2355	tine rubber spacer	23
	2390	HP plain washer	2
	2991	bearing	1
	4926	tine blade	24
	5117	reel shaft	1
BRUSH REEL			
item	part	description	qty
	1034	split pin	2
	2991	bering	1
	5117	REEL SHAFT	1
	7541	BRUSH	1
COMBINED REEL			
item	part	description	qty
	1034	split pin	2
	2355	rubber spacer	11
	2390	square bore washer	2
	2991	pressed steel bearing	1
	4889	tine blade	24
	5117	tine shaft	1
	33559	rubber tine spacer (brush)	11
	2355	rubber spacer	11
	21128	no nail box	1
THATCH REMOVAL REEL			
item	part	description	qty
	1034	split pin	2
	2355	tine rubber spacer	23
	2390	HP plain washer	2
	2991	bearing	1
	4889	tine blade	24
	5117	reel shaft	1

WIRE TINE REEL

item	part	description	qty
	1034	split pin	2
	2991	bearing	1
	4464	tine unit assembly	9
	5117	tine reel shaft	1

SPECIAL REEL FOR SYNTHETIC TURF

item	part	description	qty
	32981	tine unit assembly	9
	1034	split pin	2
	2991	bearing	1
	5117	tine reel shaft	1
	2390	HP washer	3

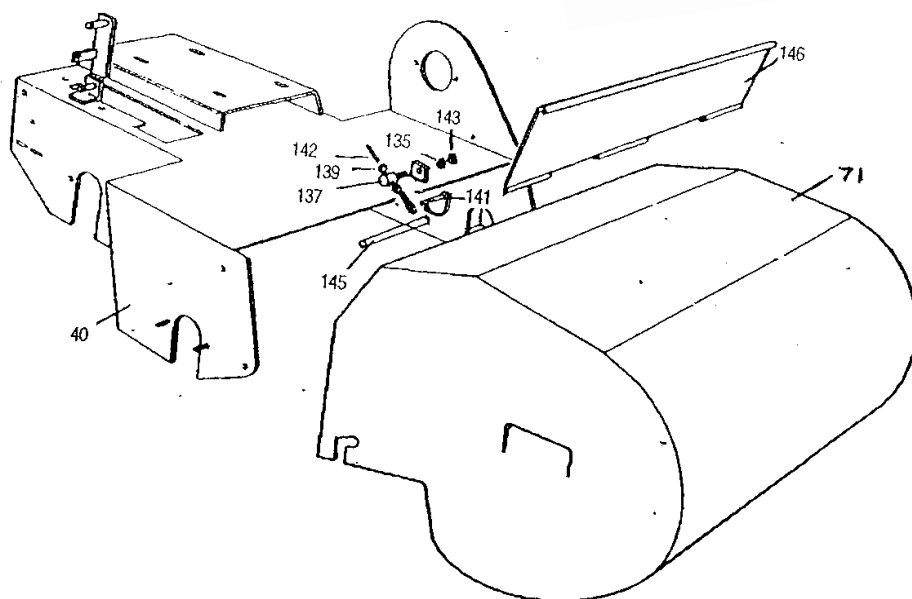
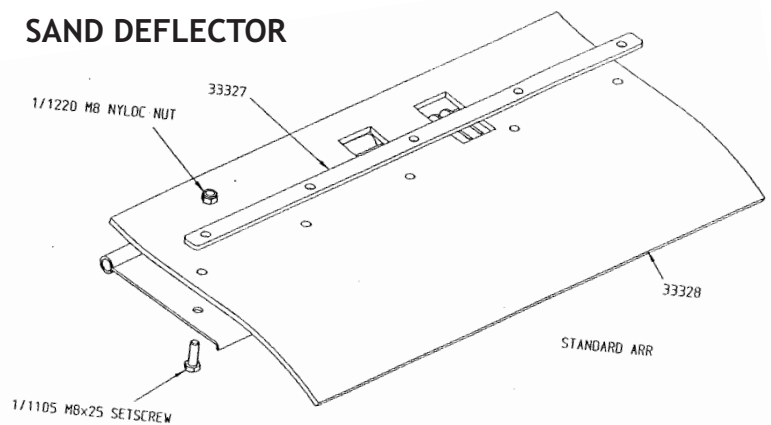
SAND DEFLECTOR KIT ALSO REQUIRED WITH ABOVE

item	part	description	qty
	33328	sand deflector	1
	33327	clamp plate	1
	1/1220	nyloc nut	5
	1/1105	setscrew	5

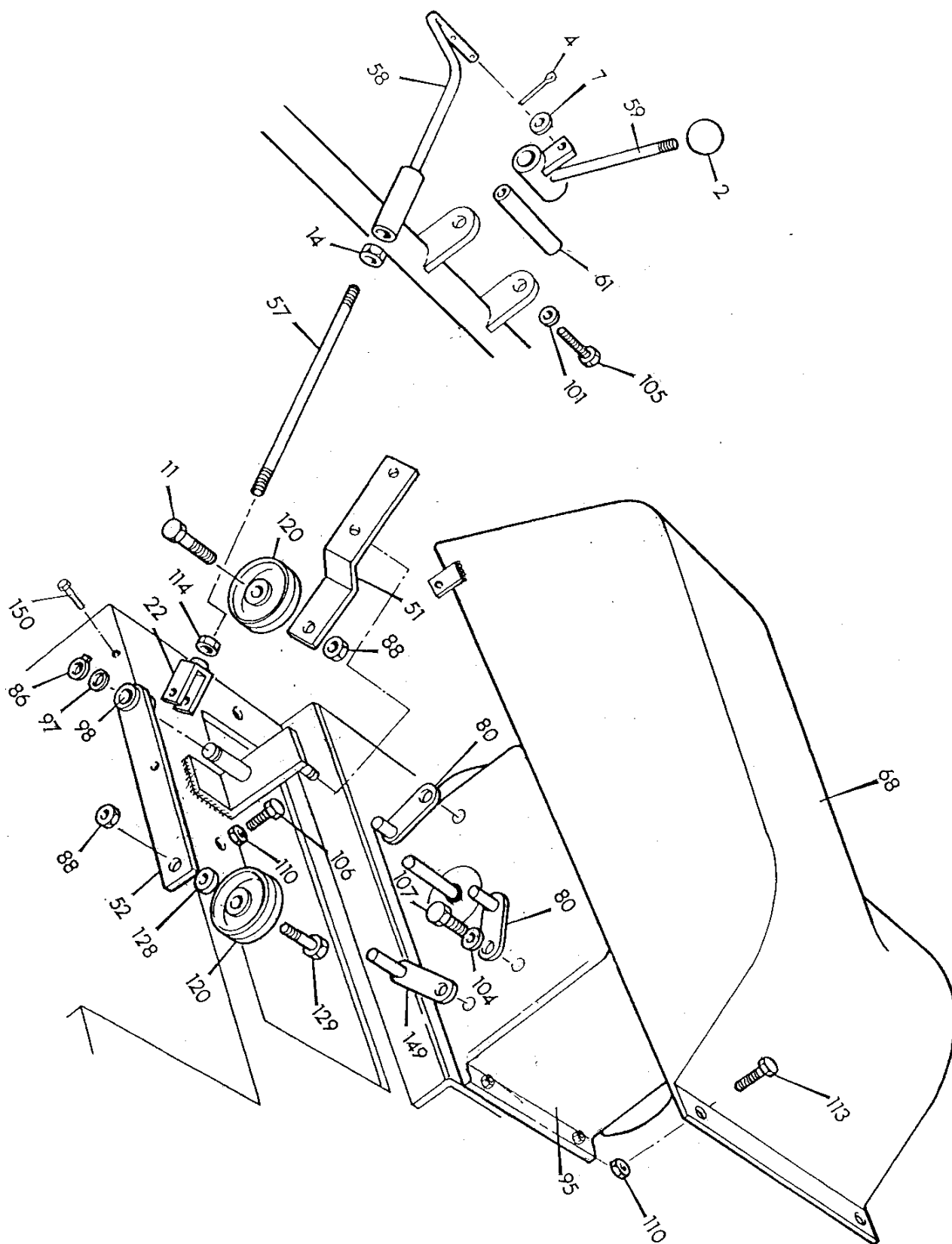
VERTICUTTING REEL

item	part	description	qty
	2352	triangular tine blade	35
	5117	tine shaft	1
	34187	rubber spacer	34
	2390	square bore washer	2
	1034	split pin	2
	2991	2 bolt flange bearing	1
	21128	no nail box	1

SAND DEFLECTOR



GRASS BOX



sisis

VIBRATION LEVELS

METHOD USED	MONITRAN VM1100 with hand held sensor
MACHINE NAME	Auto-Rotorake Mk. 4
MACHINE REFERENCE	ARR/4
ENGINE	Briggs & Stratton
VIBRATION LEVEL	1.05g 10.29m/s ²

ALL READINGS TAKEN AT FULL REVS

PERSONAL SAFETY EQUIPMENT

Use Safety Glasses

☐

Use Breathing Mask

☐

Use Safety Gloves

☒

Use Ear Protectors Optional

Use Safety Boots

☒

SISIS EQUIPMENT (Macclesfield) LIMITED

Hurdsfield, Macclesfield, Cheshire Sk10 2LZ, England Tel : 01625 503030 Fax : 427426
Spares Hotline : 503020 Email : info@sisis.com Website www.sisi.com